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ABSTRACT

An alcohol misuse prevention study (AMPS) curriculum was developed, implemented, and evaluated with over 5,000 fifth and sixth grade students. The AMPS program, emphasizing peer resistance skills, focused on the immediate effects of alcohol, risks of alcohol misuse, and social pressures to misuse alcohol. Schools were randomly assigned to curriculum, curriculum plus booster, or control groups with one-half of each group pretested and all posttested. Measures focused on alcohol use and misuse, susceptibility to peer pressure, tolerance of deviance, pretest drinking status, prior supervised versus unsupervised drinking, parental drinking, and health locus of control. Results for 791 fifth graders and 714 sixth graders who were pretested and present at all testing occasions revealed that, at the 26-month follow-up, the hypothesized treatment by occasion interaction effect on alcohol use and misuse scores was not significant. Addition of a third factor to analyze the data by various subgroups resulted in significant three-way interactions. Both the treatment and control students with little prior exposure to alcohol use showed relatively small increases in alcohol use and misuse which resulted in no significant differences between these groups at the final posttest, while control students with more prior exposure to alcohol use showed more rapid increases in alcohol use and misuse than did their treatment group counterparts. Nineteen references and seven tables are attached. (Author/NB)

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Adolescent Attitudes and Prevention Strategies

T.E. Dielman,Ph.D., Jean T. Shope, Ph.D., Amy T. Butchart, B.A.

Abstract

An alcohol misuse prevention study (AMPS) curriculum was developed, implemented and evaluated with over 5,000 fifth and sixth grade students. The AMPS program, emphasizing peer resistance skills, focused on the immediate effects of alcohol, risks of alcohol misuse, and social pressures to misuse alcohol. Schools were randomly assigned to curriculum, curriculum plus booster, or control groups with half of each group pretested and all posttested. The results are reported for 791 fifth grade and 714 sixth grade students who were pretested and present at all testing occasions. Measures focused on alcohol use and misuse, susceptibility to peer pressure, tolerance of deviance, pretest drinking status, prior supervised versus unsupervised drinking, parental drinking, and health locus of control. At the 26 month follow-up the hypothesized treatment by occasion interaction effect on alcohol use and misuse scores was not significant. Addition of a third factor to analyze the data by various subgroups resulted in significant three-way interactions which indicated that both the treatment and control students with little prior exposure to alcohol use showed relatively small increases in alcohol use and misuse which resulted in no significant differences between these groups at the final posttest, while control group students with more prior exposure to alcohol use showed more rapid increases in alcohol use and misuse than their treatment group counterparts. The results provide support for Goodstadt's (1986) suggestion that prevention programs be designed differently for different subroups and analyzed separately by subgroups who have been shown to differ or can be expected to differ for theoretical reasons on the dependent variables or strong predictors of them. The results suggests that the concept of susceptibility to peer pressure is one which should be formally targeted and measured in the design and evaluation of school-based prevention programs.

Introduction

Recent studies have indicated that children are beginning to use alcohol earlier [1] and are drinking more heavily at younger ages [2, 3]. These findings, along with data indicating that those who misuse alcohol as young people tend to be overrepresented among adult problem drinkers and alcoholics [4, 5], have stimulated efforts in school-based prevention of alcohol misuse [2, 6-8]. Reviews of the early programs designed to prevent alcohol misuse among students have concluded that the programs were ineffective in preventing alcohol misuse behavior [9-12]. Careful consideration of the early studies reveals a number of shortcomings in the design of the studies, the conceptualization of the programs and their evaluations, and the methodology employed in implementing and evaluating the programs. Problems in the early programs include: 1) poorly formulated educational goals, 2) inadequately designed evaluations, 3) lack of realistic objectives, 4) lack of any theoretical basis, 5) a focus on measuring changes in information, attitudes, or intentions which were assumed to be correlated with the behavior in question, 6) an exclusive reliance on short-term differences between groups on behavioral measures if behavioral outcomes were measured, 7) failure to carefully consider or specify the behavioral outcome measures, and 8) lack of standardization of the program implementation.

Goodstadt [13] has identified additional dimensions to consider in the formulation of educational goals and evaluation plans for substance abuse prevention programs. Investigators should consider the possibility of formulating separate objectives and outcomes for distinct target groups in the design of both the prevention program and the evaluation. Most programs in the past have proceeded in both design and evaluation as if all recipients were non-users. A program designed for non-users may be differentially effective, or ineffective, for current users. Combining these two groups in the analysis of the outcome data could attenuate or mask completely a program effect which would be seen if data were analyzed separately for the users and non-users. The current report is based on a test of this proposition.

Method

The Alcohol Misuse Prevention Study, or AMPS, which is currently being conducted by the authors, is based on a social skills approach and addresses many of the shortcomings noted in the earlier studies. The goal of the prevention program was to provide students with the social skills necessary to prevent alcohol misuse. A conceptual model was developed which specified the hypothesized direct and indirect program effects on the intervening and outcome variables, as well as the relationships among those variables. This model guided the development of the AMPS program objectives, curriculum materials, and evaluation instrument [14]. Learning gains by the treatment group students were regarded as a necessary first result of the intervention. Behavioral differences between the treatment and control groups were hypothesized to follow at later posttest occasions, reflecting a more rapid rate of increase in alcohol misuse among the control group students than among the treatment group students.

The AMPS curriculum, developed by the authors specifically for this project [15], was designed to actively involve students and to offer positive reinforcement for their efforts. The first year's curriculum was presented in four sessions, each 45 minutes long. In the second year "booster" curriculum, three 45-minute sessions were presented. Each session was previewed, taught, and then summarized. Previous sessions were reviewed. Audiovisual materials, student activity sheets, and handouts were designed to maintain interest. The sessions provided multiple opportunities for students to develop and practice their new skills in role-playing saying "No" to peer pressure. In the fourth session, students were videotaped refusing the offer of a drink in hypothetical situations, and then viewed the videotape of their successful refusals. The goals, objectives, and activities for the sessions are summarized in Table 1. The curriculum was pilot tested by project staff in two school districts which were not in the main study. After appropriate revisions were made, special project staff teachers were hired and trained to implement the curriculum in a standardized manner.

A randomized pre-post, experimental-control group design, following individual students longitudinally, was used to evaluate the program's behavioral outcomes. Students from 213

classrooms were assigned randomly by school building to one of three experimental conditions (treatment, treatment plus booster, and control) in the case of the fifth grade students, and to treatment and control conditions in the case of the sixth grade students. Each of these groups was divided randomly into pretest and no pretest conditions to allow a test of the effect of pretesting and the pretest-treatment interaction on the self-reported behavior. The study design included posttesting students at the end of the first school year in which the prevention program was presented, as well as at the end of the two subsequent school years. Students who were in the fifth and sixth grades at the beginning of the study were chosen as the focus of the study in order to test the effectiveness of the prevention program presented before the students' entry into junior high school, where there is increasing exposure to alcohol and pressure to misuse alcohol [16]. The analyses to be presented are based on the 791 fifth grade and 714 sixth grade students who were pretested and who were present at all testing occasions.

Questionnaire items were developed to measure awareness of curriculum content, alcohol use, misuse of alcohol (overindulgence, trouble with peers, and trouble with adults), pretest drinking status, susceptibility to peer pressure, tolerance of deviance, prior supervised and unsupervised drinking exposure, parents' drinking, and health locus of control. The details of the index construction procedures and item content are provided elsewhere [17]. In a pilot study, a group of students who provided saliva samples and were informed that their self-reports would be objectively verified did not report alcohol use or misuse at a different rate than the control group [18]. Therefore, the self-reports were judged to be equally valid for both groups and the bogus pipeline method was not used in the main study. Care was taken during the implementation and evaluation phases of the study to ensure that any differences found between the treatment and control groups could be attributed to the effects of the prevention program. Schools were matched on socioeconomic, ethnic, and achievement variables prior to random assignment to treatment conditions. A high level of participation in the study was sought and achieved. Checks for consistency, out of range codes, and inaccurate reporting were conducted. Checks were conducted to ensure that each student's record was correctly matched with the records of the data provided by

the same student at other testing occasions. A detailed account of the quality control procedures is provided elsewhere [19].

Results

A series of three-way repeated measures analyses of variance were conducted to determine differential subgroup effects of the program on alcohol use and misuse. The analyses were conducted separately for the fifth and sixth grade students because the four-way interactions with grade level as the fourth factor were often significant. Each analysis had treatment level and occasion as two factors, and the students' standing on each of the seven moderator variables (susceptibility to peer pressure, adult locus of control, internal locus of control, tolerance of deviance, prior supervised/unsupervised drinking, pretest drinking status, and parental drinking) served as the third factor in the seven analyses for each of the four dependent variables (alcohol use, overindulgence, trouble with peers, and trouble with adults) at each grade level.

The main effect of occasion was highly significant across all analyses, reflecting the fact that students use and misuse alcohol to a greater extent as they progress from early grade five and six through late grade seven and eight. The main effect of treatment reached traditional levels of statistical significance (.05 or better) only in three of the seven analyses of the grade five trouble with adults data and three of the seven analyses of the grade five alcohol use data. These main effects generally indicated lower use and misuse of alcohol by treatment group students than the control group students, averaged over all occasions and all levels of the moderator variable. The main effects of the moderator variables reached traditional significance levels in the hypothesized directions in all analyses in the case of prior supervised vs unsupervised drinking; all but grade six overindulgence in the case of pretest drinking status; all grade five analyses, as well as grade six overindulgence, in the case of susceptibility to peer pressure; all grade five and none of the grade six analyses using tolerance of deviance; three of the grade five analyses (overindulgence, trouble with peers, and alcohol use) and none of the grade six analyses using internal locus of control; two of the grade five analyses (overindulgence and alcohol use) and none of the grade six analyses

using parental drinking, and one grade five (alcohol use) and none of the grade six analyses using adult locus of control.

The three-way interactions which are of specific interest in the current report reached traditional levels of statistical significance in all instances at grade five and two at grade six (trouble with peers and trouble with adults) when using the pretest drinking status variable as the third factor; in two instances at grade six (alcohol use and trouble with peers) and one instance at grade five (trouble with adults) when using prior supervised vs unsupervised drinking as the third factor; in two instances at grade five (alcohol use and trouble with peers) when using parental drinking as the third factor, and in the analysis of the grade five trouble with peers data using internal locus of control as the third factor. The results at the fifth grade level were mixed in every instance, with no clear evidence of the efficacy of the prevention program in any of the subgroup analyses. The significant three-way interactions in these cases were due to one or more groups deviating from the general pattern of results (such as one of the control subgroups starting out at a high level of alcohol misuse and decreasing over time).

The data for the four grade six three-way interactions which were statistically significant as well as two which approached traditional levels of significance, grade 6 trouble with adults by prior supervised/unsupervised drinking ($p=.10$) and grade 6 alcohol use by pretest drinking status ($p=.15$), are shown in Tables 2 through 7. Tables 2 and 3 show the mean and standard deviations for the grade six alcohol use index by pretest drinking status and prior supervised vs unsupervised drinking, respectively. Table 2 shows that both treatment and control group students who were abstainers at pretest exhibited significantly lower levels of alcohol use at posttest occasions than those who were former or current users of alcohol at pretest. Among former and current alcohol users, however, the treatment group students showed lower levels of alcohol use than the control group students at the final posttest. It is notable that these differences were statistically detectable only at the final posttest occasion. Table 3 shows a similar pattern of results for the prior supervised vs unsupervised drinking variable, which is positively correlated with the pretest drinking status variable. In this case, the treatment group students who had been exposed to both

supervised and unsupervised drinking at pretest exhibited lower levels of alcohol use at the final testing occasion than their control group counterparts. This difference was not detectable among students who had not been exposed to unsupervised drinking at the time of the pretest.

The results are presented for the trouble with peers index in Tables 4 and 5. Table 4 shows the grade six means and standard deviations by prior supervised vs unsupervised drinking. The results in Table 4 are not as clearly in support of the hypothesis. In this instance the control group students who were former alcohol users at pretest showed a rapid increase, which resulted in a significant difference in the predicted direction from their treatment group counterparts at the final posttest, while the control group students who were current alcohol users at pretest showed a decline which resulted in a significant difference contrary to hypothesis at the final posttest. The results shown in Table 5 for the grade six trouble with peers index by prior supervised vs unsupervised drinking are fully supportive of the hypothesis, however, with a significant difference in the predicted direction between the treatment and control group students who had unsupervised exposure to alcohol at pretest. The students with no exposure or exposure to only supervised use at pretest had much lower scores on the trouble with peers index at the posttest occasions, and the treatment and control group means did not differ significantly.

A similar pattern of results can be seen in Tables 6 and 7, which present the means and standard deviations for the grade six trouble with adults index by pretest drinking status and prior supervised vs unsupervised drinking. Table 6 shows that the subgroup of control students who were current users of alcohol at pretest showed a decline on the trouble with adults index score which resulted in a difference which was contrary to prediction at the final posttest, while the control students who were former alcohol users at pretest showed a large increase on the trouble with adults index which resulted in a difference in the predicted direction. The results shown in Table 7, which presents the grade six mean and standard deviations on the trouble with adults index by prior supervised vs unsupervised drinking are supportive of the hypothesis. The subgroup of control students who reported both supervised and unsupervised drinking at pretest showed significantly higher scores on the trouble with adults index than their treatment group

counterparts at the final testing occasion. The differences between control and treatment group students who were abstainers or reported only supervised alcohol use at pretest were not significant.

Discussion

The results of this investigation support Goodstadt's (1986) suggestion that prevention programs be designed to target various subgroups and that the evaluation of prevention programs be designed to assess subgroup effects. Although the data analysis over all subjects did not reveal the hypothesized statistically significant treatment by occasion interaction effect, the inclusion of a third factor resulted in some significant three-way interactions which were in the predicted direction. The clearest of these was that students with less prior exposure to alcohol use did not show large gains in alcohol use and misuse over the two and one-half year follow-up, and at the final posttest occasion the treatment and control students in these groups did not differ significantly. The treatment and control students with more exposure to alcohol use at pretest, however, showed a divergence in their rates of alcohol use and misuse, with the treatment subgroup exhibiting significantly lower rates than the control group by the final posttest occasion.

The results also indicate that the design of prevention programs to target different subgroups should focus on decreasing the susceptibility to peer pressure, and that the analysis of program effects should be conducted separately for groups with different levels of prior exposure to alcohol use at pretest. The results of this study further indicate that there is little to be gained in prevention studies from the measurement of or attempts to influence levels of health locus of control or tolerance of deviance.

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TABLE 1. ALCOHOL MISUSE PREVENTION CURRICULUM

Session/Goal	Objectives	Activity Summary
Session 1		
Make students aware of the various pressures which in-fluence people to drink alcohol, the short term effects of alcohol and the risks of alcohol misuse.	• Identify 3 sources of pressure which influence people to drink alcohol. • State correctly 3 facts about alcohol and its short term effects. • Identify 2 risks of alcohol misuse.	Discussion, film, fact sheet, worksheet, crossword puzzle, anticipation of next session.
Session 2		
Develop students' awareness of advertising pressures to drink alcohol and to develop the ability to resist such pressures.	• Identify 4 types of appeals used in alcohol advertising. • Develop and use strategies to resist alcohol advertising pressures. • Recognize that advertising pressures and peer pressure are based on the same appeal.	Review, discussion, slides of alcohol advertisements, copies of different advertisements for students, worksheet, posters for class, pamphlets for each student, anticipation of next session.
Session 3		
Help students develop ways to resist pressure and to practice refusing offers to drink alcohol.	• Identify five categories of responses which can be used in resisting pressure. • Develop responses in each category. • Refuse the offer of a drink of alcohol in three different ways.	Review, discussion, film, worksheets, role playing, stickers for each student, anticipation of next session.
Session 4		
Provide students practice in ways to resist peer pressure to drink alcohol.	• Understand that it is possible to turn down the offer of an alcoholic drink without offending anyone. • Understand that the more you say "No Thanks," the easier it is. • Demonstrate 3 successful ways to resist the offer of an alcoholic drink.	Review, discussion, worksheet, role playing specific situations, film with music/lyrics on handout, poster for class.

TABLE 1 (Continued)

Session/Goal	Objectives	Activity Summary
Booster Session 1		
Review and reinforce student awareness of the risks of alcohol misuse, the short-term effects of alcohol, and the various pressures which influence people to drink alcohol.	• Define alcohol misuse. • Identify 2 risks of alcohol misuse. • State correctly 3 facts about alcohol and its short-term effects. • Identify 3 sources of pressure which influence people to drink alcohol.	Discussion, worksheets, fact sheet, poster for class, anticipation of next session.
Booster Session 2		
Review and reinforce the abilities to resist advertising pressure and to resist peer pressure to drink alcohol.	• State 4 types of appeals used in alcohol advertising and a strategy to resist alcohol advertising pressure. • Recognize that advertising pressure and peer pressure are based on some of the same appeals. • Identify 3 characteristics of successful resistance of peer pressure. • Effectively refuse the offer of a drink in 3 different ways. • Begin to anticipate future drinking situations; recognize potential alcohol misuse and risks of misuse; and develop strategies to respond.	Review, discussion, role-playing, advice panel, worksheets, poster for class, pamphlets for each student, anticipation of next session.
Booster Session 3		
Provide more practice in resisting peer pressure to drink alcohol.	• Recognize and utilize nonverbal behavior (body language) in refusals to the offer of an alcoholic drink. • Anticipate a future drinking situation; plan and practice ways to resist peer pressure in that situation. • Understand that the more you say, "No, thanks," the easier it is. • Understand that it is possible to turn down the offer of an alcoholic drink without offending anyone or lying.	Review, discussion, worksheet, skit development and performance, buttons for each student, poster for class.

Table 2

Summary of Means and Standard Deviations

Treatment by Occasion by Pretest Drinking Status

Pretest - Post 1 - Post 2 - Post 3

Grade 6, N = 561

Dependent Variable: Alcohol Use

	Pretest		Post 1		Post 2		Post 3	
Control	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Low	.05	.22	.16	.44	.34	.74	.61	.89
Med	.87	.87	.61	.66	1.30	.93	1.65	1.23
High	1.70	1.42	1.90	1.29	2.00	1.49	2.50	1.43
Treatment								
Low	.07	.31	.26	.58	.40	.72	.77	.98
Med	.63	.69	.66	.58	.85	.85	1.29	.98
High	1.50	1.10	1.96	1.40	1.88	1.24	2.00	1.30

Table 3

Summary of Means and Standard Deviations

Treatment by Occasion by Prior Supervised vs Unsupervised Drinking

Pretest - Post 1 - Post 2 - Post 3

Grade 6, N = 576

Dependent Variable: Alcohol Use

	Pretest		Post 1		Post 2		Post 3	
Control	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
None	.01	.12	.04	.35	.27	.64	.56	.89
Supervised	.18	.50	.43	.78	.51	.89	.74	.96
Both	1.09	1.00	1.03	.87	1.62	1.07	2.09	1.16
Treatment								
None	.01	.11	.13	.35	.26	.57	.67	.96
Supervised	.22	.50	.42	.68	.61	.80	.91	.91
Both	.97	.98	1.27	1.18	1.27	1.18	1.67	1.25

Table 4

Summary of Means and Standard Deviations

Treatment by Occasion by Pretest Drinking Status

Pretest - Post 1 - Post 2 - Post 3

Grade 6, N = 645

Dependent Variable: Trouble with Peers

	Pretest		Post 1		Post 2		Post 3	
Control	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Low	.01	.08	.03	.21	.01	.11	.11	.48
Med	.00	.00	.17	.53	.33	.80	.73	1.05
High	.73	1.10	.36	.81	.36	.50	.27	.65
Treatment								
Low	.02	.20	.04	.26	.08	.40	.16	.57
Med	.11	.47	.12	.43	.14	.52	.21	.59
High	.31	.76	.28	.59	.38	.86	.59	.98

Table 5

Summary of Means and Standard Deviations

Treatment by Occasion by Prior Supervised vs Unsupervised Drinking

Pretest - Post 1 - Post 2 - Post 3

Grade 6, N = 666

Dependent Variable: Trouble with Peers

	Pretest		Post 1		Post 2		Post 3	
Control	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
None	.00	.00	.02	.22	.02	.16	.11	.44
Supervised	.03	.23	.08	.32	.05	.22	.16	.65
Both	.22	.62	.28	.68	.28	.72	.80	.99
Treatment								
None	.00	.00	.02	.23	.10	.45	.10	.46
Supervised	.03	.20	.05	.21	.04	.35	.20	.57
Both	.23	.68	.21	.49	.30	.70	.37	.85

Table 6

Summary of Means and Standard Deviations

Treatment by Occasion by Pretest Drinking Status

Pretest - Post 1 - Post 2 - Post 3

Grade 6, N = 641

Dependent Variable: Trouble with Adults

	Pretest		Post 1		Post 2		Post 3	
Control	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Low	.00	.00	.01	.11	.01	.11	.05	.28
Med	.07	.25	.00	.00	.13	.35	.37	.49
High	.09	.30	.09	.30	.18	.60	.09	.30
Treatment								
Low	.01	.11	.01	.09	.04	.22	.09	.34
Med	.05	.22	.08	.27	.03	.16	.08	.31
High	.14	.35	.10	.31	.07	.26	.17	.54

Table 7

Summary of Means and Standard Deviations

Treatment by Occasion by Prior Supervised vs Unsupervised Drinking

Pretest - Post 1 - Post 2 - Post 3

Grade 6, N = 662

Dependent Variable: Trouble with Adults

	Pretest		Post 1		Post 2		Post 3	
Control	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
None	.00	.00	.01	.11	.01	.11	.05	.27
Supervised	.00	.00	.01	.11	.03	.16	.06	.30
Both	.15	.36	.08	.27	.18	.45	.35	.28
Treatment								
None	.00	.00	.02	.13	.02	.13	.03	.18
Supervised	.02	.12	.01	.07	.03	.20	.10	.38
Both	.09	.29	.13	.37	.12	.36	.22	.54